

Appln. No. 10/666,593

Attorney Docket No. DKT03009

I. Listing of Claims

1. (Currently Amended): An apparatus for controlling yaw in a motor vehicle comprising, in combination:

a rear axle having an input adapted to receive drive torque and drive a pair of independently operable clutches adapted to drive a respective one of a pair of rear axles;

a plurality of speed sensors for sensing speeds of a plurality of tire and wheel assemblies;

a steering angle sensor;

a lateral acceleration sensor;

a yaw rate sensor; and

a microprocessor adapted to received signals from said sensors and provide first and second independent signals for actuating said pair of clutches, said microprocessor including ~~means for detecting left and right oversteer and left and right understeer of said vehicle~~ a pair of traction controller modules each having inputs for said plurality of speed sensors and said steering angle sensor and providing a torque output signal, a dynamics controller module having inputs for said plurality of speed sensors, said steering angle sensor, said lateral acceleration and yaw rate sensor, a yaw rate reference calculation subroutine, an oversteer and an understeer detection subroutine and a clutch selector subroutine providing left and right control outputs and an arbitrator module having inputs for said outputs from said pair of traction controller modules and said dynamics controller module.

2. (Original): The apparatus of claim 1 wherein each of said pair of clutches includes an electromagnetic operator.

3. (Original): The apparatus of claim 1 wherein each of said pair of clutches includes a ball ramp operator.

4. (Original): The apparatus of claim 1 further including a first driveline including a transaxle, a pair of front axles, a pair of front tire and wheel assemblies and driving a rear propshaft.

-2-



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Appln. No. 10/666,593

Attorney Docket No. DKT03009

5. (Original): The apparatus of claim 1 wherein said steering angle sensor senses rotation of a steering column of said vehicle.

6. (Original): The apparatus of claim 1 wherein said microprocessor includes a PWM driver circuit adapted to drive electromagnetic operators in said clutches.

7. (Original): The apparatus of claim 1 wherein said microprocessor computes a yaw acceleration value.

8. (Original): The apparatus of claim 1 wherein said microprocessor includes a proportional integral derivative controller.

9. (Currently Amended): A method of controlling yaw in a motor vehicle comprising the steps of:

sensing speeds of wheels of such motor vehicle;

sensing a throttle position of such vehicle.

sensing a position of a steering component of such vehicle;

sensing a yaw rate of such vehicle;

determining a first torque value from said speeds, said steering position and throttle position.

determining at least one of left oversteer, right oversteer, left understeer and right understeer of such vehicle and providing left and right torque values;

arbitrating said first, left and right torque values and providing a pair of clutch signals;

providing a rear axle having an input member for receiving drive torque and driving a pair of independently operable clutches adapted to drive a respective one of a pair of rear wheels; and

activating said pair of clutches in response to said ~~determining of understeer and oversteer~~ pair of respective clutch signals.

10. (Original): The method of controlling yaw in a motor vehicle of claim 9 further including the step of sensing lateral acceleration.

-3-

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Attorney Docket No. DKT03009

11. (Original): The method of controlling yaw in a motor vehicle of claim 9 further including the step of determining a yaw rate error signal.

12. (Original): The method of controlling yaw in a motor vehicle of claim 9 further including the step of determining a yaw acceleration value.

13. (Original): The method of controlling yaw in a motor vehicle of claim 9 further including the step of arbitrating between outputs of traction controllers and a dynamics controller.

14. (Cancelled).

15. (Currently Amended): A method of controlling yaw in a motor vehicle comprising the steps of:

sensing speeds of wheels of such motor vehicle;

sensing a throttle position of such vehicle;

sensing a position of a steering component of such vehicle;

sensing a yaw rate of such vehicle;

sensing lateral acceleration of such vehicle;

determining a first torque control output from said sensed speeds, said throttle position and said steering position;

determining left oversteer, right oversteer, left understeer and right understeer of such vehicle and providing left and right control torque outputs;

arbitrating said first, left and right torque control outputs and providing a pair of clutch drive signals;

providing a rear axle having an input member for receiving drive torque and driving a pair of independently operable clutches adapted to drive a respective one of a pair of rear wheels, and activating said clutches in response to ~~the sensing of understeer and oversteer~~ said pair of clutch drive signals.

16. (Original): The method of claim 15 including the step of determining a yaw rate error signal.

Appln. No. 10/666,593

Attorney Docket No. DKT03009

17. (Original): The method of claim 16 further including the step of utilizing a proportional integral derivative controller to correct said yaw rate error signal.

18. (Original): The method of claim 15 including the step of determining a yaw acceleration value.

19. (Cancelled).

20. (Original): The method of claim 15 including the step of arbitrating between outputs of slip controllers and a yaw controller.

-5-

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